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Chapter 5—Species of Greatest Conservation Need and their Habitats

Chapter 5—Species of Greatest Conservation Need and their Habitats

This chapter describes the status and trend of the District's species of greatest conservation need and their priority habitats.

Species of Greatest Conservation Need

Element #1 requires that the District provide information on the distribution and abundance of wildlife, including low and declining populations, that are indicative of the diversity and health of the District's wildlife. As such, the following section lists the District's species of greatest conservation need and indicates their status and trend.

As part of protecting the diversity of the District's wildlife, it is critical to conserve all types of wildlife species, including birds, mammals, reptiles, amphibians, fish and invertebrates. The District's species of greatest conservation need also include a variety of types including resident, breeding, migratory, endemic and federally protected species.

Resident and breeding species of greatest conservation need
The District's resident and breeding species keep the nation's capital diverse and ecologically healthy. Many of these species are economically important as well. For example, American Shad is a fish species of greatest conservation need that supported an important recreational fishery until it became overharvested and one of the District's most threatened fish species.

Migratory species of greatest conservation need
The District is located such that it is a stopover point for many migratory species of greatest conservation need. For example, the Cerulean Warbler is a species of greatest conservation need that is a migrant. Maintaining the integrity of migratory stopover points benefits the entire migration path of the species. Conserving habitats located within the District is vital to the efforts made by other states that share the path of the species. In turn, the District must also deal with environmental conditions outside of its jurisdictions that provide the other migration stopover points of the species.

Endemic species of greatest conservation need
Despite the District's small and urban character, it is home to two known endemic species. The Hay's Spring Amphipod and Kenk's Amphipod have been found only in the Rock Creek Valley. They are restricted to shallow groundwater communities of only five springs along Rock Creek.[31] Therefore, the District has the responsibility for ensuring their persistence.

[31] Pavek, Diane. *Endemic Amphipods in our Nation's Capital*. Endanged Species Bulletin, Jan/Feb 2002. Vol. xxvii, no. 1, p 8.

Federally protected species of greatest conservation need
Within the District, there are six federally endangered wildlife species protected by the US Fish and Wildlife Service under the Endangered Species Act of 1973.[32] They include the Bald Eagle, Bog Turtle, Atlantic Sturgeon, Shortnosed Sturgeon, Dwarf Wedgemussel, and Hay's Spring Amphipod. The District has no federally endangered mammal or amphibian species of greatest conservation need.

The following table shows what percentage of the District's wildlife species are of greatest conservation need. It also shows the percentage of species by taxa.

Table 4. Summary statistics of the District's wildlife species, by taxa

Taxa	Total # species in DC	Total # SGCN	% SGCN
Birds	249	35	14
Mammals	53	11	21
Reptiles	47	23	49
Amphibians	29	16	55
Fish	90	12	13
Invertebrates	314	51	16
Total	782	148	19

[32] http://www.fws.gov/endangered/esa.html

Species selection

The selection of species of greatest conservation need was made using the best possible information and expertise available at the time. Whereas conditions and threats change over time as a result of conservation actions, new information, and changing conditions, the list is subject to change. As mentioned, as the District implements Required Elements #6 and 7 by monitoring and revising the CWCS, a change in the population status or trend of a species may necessitate the modification of the list of species of greatest conservation need.

Table 5. Species of greatest conservation need

BIRDS

Acadian Flycatcher
Empidonax virescens

American Bittern
Botaurus lentiginosus

American Black Duck
Anas rubripes

American Woodcock
Scolopax minor

Bald Eagle
Haliaeetus leucocephalus

Black-crowned Night-Heron
Nycticorax nycticorax

Bobolink
Dolichonyx oryzivorus

Broad-winged Hawk
Buteo platypterus

Brown Creeper
Certhia americana

Brown Thrasher
Toxostoma rufum

Cerulean Warbler
Dendroica cerulean

Chimney Swift
Chaetura pelagica

Eastern Meadowlark
Sturnella magna

Eastern Towhee
Pipilo erythrophthalmus

Field Sparrow
Spizella pusilla

Grasshopper Sparrow
Ammodramus savannarum

Great Horned Owl
Bubo virginianus

Hooded Warbler
Wilsonia citrine

Kentucky Warbler
Oporornis formosus

Least Bittern
Ixobrychus exilis

Louisiana Waterthrush
Seiurus motacilla

Marsh Wren
Cistothorus palustris

Northern Bobwhite
Colinus virginianus

Ovenbird
Seiurus aurocapilla

Prothonotary Warbler
Protonotaria citrea

Red-shouldered Hawk
Buteo lineatus

Scarlet Tanager
Piranga olivacea

Sora
Porzana carolina

Virginia Rail
Rallus limicola

White-eyed Vireo
Vireo griseus

Wilson's Snipe
Gallinago delicata

Wood Duck
Aix sponsa

Wood Thrush
Hylocichla mustelina

Worm-eating Warbler
Helmitheros vermivorus

Yellow-throated Vireo
Vireo flavifrons

MAMMALS

Allegheny Woodrat
Neotoma magister

American Mink
Mustela vison

Eastern Chipmunk
Tamias striatus

Eastern Cottontail
Sylvilagus floridanus

Eastern Red Bat
Lasiurus borealis

Eastern Small-footed Myotis
Myotis lebii

Gray Fox
Urocyon cinereoargenteus

Northern River Otter
Lutra canadensis

Southern Bog Lemming
Synaptomys cooperi

Southern Flying Squirrel
Glaucomys volans

Virginia Opossum
Didelphis virginiana

REPTILES

Bog Turtle
Clemmys muhlenbergii

Common Musk Turtle
Sternotherus odoratus

Corn Snake
Elaphe guttata guttata

Eastern Box Turtle
Terrapene carolina

Eastern Fence Lizard
Sceloporus undulates

Eastern Garter Snake
Thamnophis sirtalis

Eastern Hognose Snake
Heterodon platirhinos

Eastern Mud Turtle
Kinosternon subrubrum

Eastern Painted Turtle
Chrysemys picta picta

Eastern Ribbon Snake
Thamnophis sauritus

Eastern Worm Snake
Carphophis amoenus amoenus

Five-lined Skink
Eumeces fasciatus

Northern Black Racer
Coluber constrictor

Northern Brown Snake
Storeria dekayi

Northern Copperhead
Agkistsrodon contortrix

Northern Ringneck Snake
Diadophis punctatus edwardsii

Queen Snake
Regina septemvittata

Redbelly Turtle
Pseudemys rubriventris

Rough Green Snake
Opheodrys aestivus

Scarlet Snake
Cemophora coccinea copei

Spotted Turtle
Chrysemys guttata

Timber Rattlesnake
Crotalus horridus

Wood Turtle
Clemmys inscuplta

AMPHIBIANS

American Toad
Bufo americanus

Bullfrog
Rana catesbeiana

Fowler's Toad
Bufo fowleri

Marbled Salamander
Ambystoma opacum

Mud Salamander
Pseudotriton montanus

Northern Cricket Frog
Acris crepitans

Northern Dusky Salamander
Desmognathus fuscus

Northern Spring Peeper
Pseudacris crucifer

Northern Two-lined Salamander
Eurycea bislineata

Pickerel Frog
Rana palustris

Northern Red Salamander
Pseudotriton rubber ruber

Redback Salamander
Plethodon cinereus

Red Spotted Newt
Notophthalmus viridescens

Spotted Salamander
Ambystoma maculatum

Upland Chorus Frog
Pseudacris feriarum feriarum

Wood Frog
Rana sylvatica

FISH

Alewife
Alosa pseudoharengus

American Eel
Anguilla rostrata

American Shad
Alosa sapidissima

Atlantic Sturgeon
Acipenser oxyrhynchus

Blueback Herring
Alosa aestivalis

Bowfin
Amia calva

Central Stoneroller
Campostoma anomalum

Greenside Darter
Etheostoma blennioides

Hickory Shad
Alosa mediocris

Shortnosed Sturgeon
Acipenser brevirostrum

Silverjaw Minnow
Ericymba buccata

Warmouth
Lepomis gulosus

INVERTEBRATES

A Copepod
Acanthocyclops Columbiensis

A Copepod
Acanthocyclops Villosipes

A Copepod
Attheyella (Canthocamptus) Illiniosensis

A Copepod
Attheyella (Mrazekiella) Illiniosensis

A Copepod
Attheyella (Mrazekiella) Obatogamensis

A Copepod
Bryocamptus Hutchinsoni

A Copepod
Bryocamptus Minutus

A Copepod
Bryocamptus Nivalis

A Copepod
Bryocamptus Zschokkei

A Copepod
Diacyclops Harryi

A Copepod
Diacyclops Nearcticus

A Copepod
Eucyclops Agilis

A Copepod
Macrocyclops Albidus

A Copepod
Paracyclops Fimbriatus Chiltoni

Alewife Floater
Anodonta implicata

Appalachian Grizzled Skipper
Pyrgus wyandot

Appalachian Spring Snail
Fontigens bottimeri

Brook Floater
Alasmidonta varicosa

Crossline Skipper Butterfly
Polites origenes

Dwarf Wedgemussel
Alasmidonta heterodon

Eastern Comma Butterfly
Polygonia comma

Eastern Pondmussel
Ligumia nasuta

Edward's Hairstreak
Satyrium edwardsii Fontigens bottimeri

Emerald Spreadwing
Lestes dryas

Fine-lined Emerald
Somatochlora filosa

Frosted Elfin
Callophrys irus

Great Spangled Fritillary Butterfly
Speyeria cybele

Green Floater
Lasmigona subviridis

Grey Petaltail
Tachopteryx thoreyi

Hay's Spring Amphipod
Sygobromus hayi

Imported Cabbage Butterfly
Pieris rapae

Kenk's Amphipod
Stygobromus kenki

Lilypad Forktail Damselfly
Ischnura kellicotti williamsoni

Little Glassywing Butterfly
Pompeius verna

Mocha Emerald Dragonfly
Somatochlora linearis

Monarch Butterfly
Danaus P. Plexippus

Mottled Duskywing
Erynnis martialis

Pizzini's Cave Amphipod
Stygobromus pizzinii

Potomac Groundwater Amphipod
Stygobromus tenuis potomacus

Question Mark Butterfly
Polygonia interrogationis

Red Admiral Butterfly
Vanessa atalanta rubria

Regal Fritillary Butterfly
Speyeria idalia
Sedge Sprite
Nehalennia irene

Sphagnum Sprite
Nehalennia gracilis

Spiny-foot Copepod
Attheyella villosipes

Tidewater Mucket
Leptodea ochracea

Tiger Spiketail Dragonfly
Cordulegster errones

Triangle Floater
Alasmidonta undulata

Unicorn Clubtail Dragonfly
Arigomphus villosipes

Variegated Fritillary Butterfly
Euptoieta claudia

Yellow Lampmussel
Lampsilis cariosa

Status and Trend

Element #1 requires the CWCS to provide information on low and declining populations. Many of the District's species of greatest conservation need have one of the following population status and trends:

- Imperiled, vulnerable or declining
- Stable, but habitat is at risk
- Imperiled, vulnerable or declining in surrounding region, but undetermined within the District
- Stable in surrounding region, but undetermined within the District, or
- Undetermined within the District, but subjectively determined "of greatest conservation need" by resident experts

In cases for which the species have been determined to be imperiled, vulnerable, or declining, or if their habitat is at risk, actions will be implemented to conserve those species or habitats. In cases for which the status and trend is less understood, research and monitoring will be undertaken as a strategy of this CWCS until populations, threats and effective actions can be identified. The following table gives a species-by-species indication of these research needs by providing information on their status and trend.

Table 6. Status and trend of species of greatest conservation need

Low—population is imperiled or vulnerable
Medium—population appears to be stable
Abundant—population is over carrying capacity
Unknown—population is undetermined
PE—possibly extirpated

Sources for species status and trend data are located in Chapter 8—Conservation Actions—Species. All status and trend data for this table for the fish species of greatest conservation need was provided by Jon Siemien, Chief, Fisheries Research Branch, DC Fisheries and Wildlife Division.

	Species of Greatest Conservation Need	Status				Trend			
		Low	Medium	Abundant	Unknown	Declining	Stable	Increasing	Unknown
	Birds								
1	Acadian Flycatcher				X				X
2	American Bittern	X				X			
3	American Woodcock				X				X
4	American Black Duck				X				X
5	Bald Eagle	X							X
6	Black-crowned Night-Heron	X							X
7	Bobolink				X				X
8	Broad-winged Hawk	X							X
9	Brown Creeper				X				X
10	Brown Thrasher	X							X
11	Cerulean Warbler				X				X
12	Chimney Swift		X						X
13	Wilson's Snipe				X				X
14	Eastern Meadowlark	X							X
15	Eastern Towhee		X						X
16	Field Sparrow	X							X
17	Grasshopper Sparrow				X				X
18	Great Horned Owl	X							X
19	Hooded Warbler				X				X
20	Kentucky Warbler				X				X
21	Least Bittern	X							X
22	Louisiana Waterthrush	X							X

Species of Greatest Conservation Need		Status				Trend			
		Low	Medium	Abundant	Unknown	Declining	Stable	Increasing	Unknown
23	Marsh Wren	X							X
24	Northern Bobwhite	X							X
25	Ovenbird	X							X
26	Prothonotary Warbler	X							X
27	Red-shouldered Hawk	X							X
28	Scarlet Tanager	X							X
29	Sora Rail				X				X
30	Virginia Rail	PE							X
31	White-eyed Vireo	X							X
32	Wood Duck		X						X
33	Wood Thrush	X							X
34	Worm-eating Warbler				X				X
35	Yellow-throated Vireo	X							X
Mammals									
36	Allegheny Woodrat	PE							X
37	American Mink	X							X
38	Eastern Chipmunk		X						X
39	Eastern Cottontail		X						X
40	Eastern Red Bat		X						X
41	Eastern Small-footed Myotis	X							X
42	Gray Fox	X							X
43	Northern River Otter	X							X
44	Southern Bog Lemming	X							X
45	Southern Flying Squirrel		X						X
46	Virginia Opossum		X			X			
Reptiles									
47	Bog Turtle	PE				X			
48	Common Musk Turtle		X						X
49	Corn Snake				X				X
50	Eastern Box Turtle	X			X				X
51	Eastern Fence Lizard	PE			X				X
52	Eastern Garter Snake		X						X

	Species of Greatest Conservation Need	Status				Trend			
		Low	Medium	Abundant	Unknown	Declining	Stable	Increasing	Unknown
53	Eastern Hognose Snake	PE							X
54	Eastern Mud Turtle		X						X
55	Eastern Painted Turtle		X						X
56	Eastern Ribbon Snake		X						X
57	Eastern Worm Snake		X						X
58	Five-lined Skink		X						X
59	Northern Black Racer		X						X
60	Northern Brown Snake		X						X
61	Northern Copperhead Snake	X							X
62	Northern Ringneck Snake		X						X
63	Queen Snake	X							X
64	Redbelly Turtle		X						X
65	Rough Green Snake		X						X
66	Scarlet Snake	PE							X
67	Spotted Turtle	PE							X
68	Timber Rattlesnake	PE							X
69	Wood Turtle	PE							X
	Amphibians								
70	American Toad		X						X
71	Bullfrog		X						X
72	Fowler's Toad		X						X
73	Marbled Salamander	X							X
74	Mud Salamander	X							X
75	Northern Cricket Frog	X							X
76	Northern Dusky Salamander	X							X
77	Northern Spring Peeper		X						X
78	Northern Two-lined Salamander		X						X
79	Pickerel Frog		X						X
80	Northern Red Salamander	X							X
81	Redback Salamander		X						X
82	Red-spotted Newt	X							X
83	Spotted Salamander		X						X

	Species of Greatest Conservation Need	Status				Trend			
		Low	Medium	Abundant	Unknown	Declining	Stable	Increasing	Unknown
84	Upland Chorus Frog	X							X
85	Wood Frog	X							X
	Fish								
86	Alewife	X					X		
87	American Eel	X				X			
88	American Shad	X						X	
89	Atlantic Sturgeon	PE							
90	Blueback Herring	X					X		
91	Bowfin	X							X
92	Central Stoneroller	X							X
93	Greenside Darter	X							X
94	Hickory Shad	X						X	
95	Shortnosed Sturgeon	PE							
96	Silverjaw Minnow	X							X
97	Warmouth	X							X
	Invertebrates								
98	A Copepod *Acanthocyclops Columbiensis*				X				X
99	A Copepod *Acanthocyclops Villosipes*				X				X
100	A Copepod *Attheyella (Canthocamptus) Illiniosensis*				X				X
101	A Copepod *Attheyella (Mrazekiella) Illiniosensis*				X				X
102	A Copepod *Attheyella (Mrazekiella) Obatogamensis*				X				X
103	A Copepod *Bryocamptus Hutchinsoni*				X				X
104	A Copepod *Bryocamptus Minutus*				X				X
105	A Copepod *Bryocamptus Nivalis*				X				X
106	A Copepod *Bryocamptus Zschokkei*				X				X
107	A Copepod *Diacyclops Harryi*				X				X
108	A Copepod *Diacyclops Nearcticus*				X				X
109	A Copepod *Eucyclops Agilis*				X				X
110	A Copepod *Macrocyclops Albidus*				X				X

	Species of Greatest Conservation Need	Status				Trend			
		Low	Medium	Abundant	Unknown	Declining	Stable	Increasing	Unknown
111	A Copepod *Paracyclops Fimbriatus Chiltoni*				X				X
112	Alewife Floater				X				X
113	Appalachian Grizzled Skipper				X				X
114	Appalachian Spring Snail				X				X
115	Brook Floater				X				X
116	Crossline Skipper Butterfly				X				X
117	Dwarf Wedgemussel				X				X
118	Eastern Comma Butterfly				X				X
119	Eastern Pondmussel				X				X
120	Edward's Hairstreak				X				X
121	Emerald Spreadwing				X				X
122	Fine-lined Emerald				X				X
123	Frosted Elfin				X				X
124	Great Spangled Fritillary Butterfly				X				X
125	Green Floater				X				X
126	Grey Petaltail				X				X
127	Hay's Spring Amphipod				X				X
128	Imported Cabbage Butterfly				X				X
129	Kenk's Amphipod				X				X
130	Lilypad Forktail Damselfly				X				X
131	Little Glassywing Butterfly				X				X
132	Mocha Emerald Dragonfly				X				X
133	Monarch Butterfly				X				X
134	Mottled Duskywing				X				X
135	Pizzini's Cave Amphipod				X				X
136	Potomac Groundwater Amphipod				X				X
137	Question Mark Butterfly				X				X
138	Red Admiral Butterfly				X				X
139	Regal Fritillary Butterfly				X				X
140	Rock Creek Groundwater Amphipod				X				X
141	Sedge Sprite				X				X

	Species of Greatest Conservation Need	Status				Trend			
		Low	Medium	Abundant	Unknown	Declining	Stable	Increasing	Unknown
142	Sphagnum Sprite				X				X
143	Spiny-foot Copepod				X				X
144	Tidewater Mucket				X				X
145	Tiger Spiketail Dragonfly				X				X
146	Triangle Floater				X				X
147	Unicorn Clubtail Dragonfly				X				X
148	Variegated Fritillary Butterfly				X				X
149	Yellow Lampmussel				X				X

Habitat Types and Conditions

One of the most exciting features of the District is that while it is a bustling metropolis, it also has a variety of vibrant natural areas ranging from urban landscapes with historic monuments and memorials to deep hardwood forests for birdwatching to rivers for fishing and boating. 13 identified habitat types are considered priority habitats for conservation.

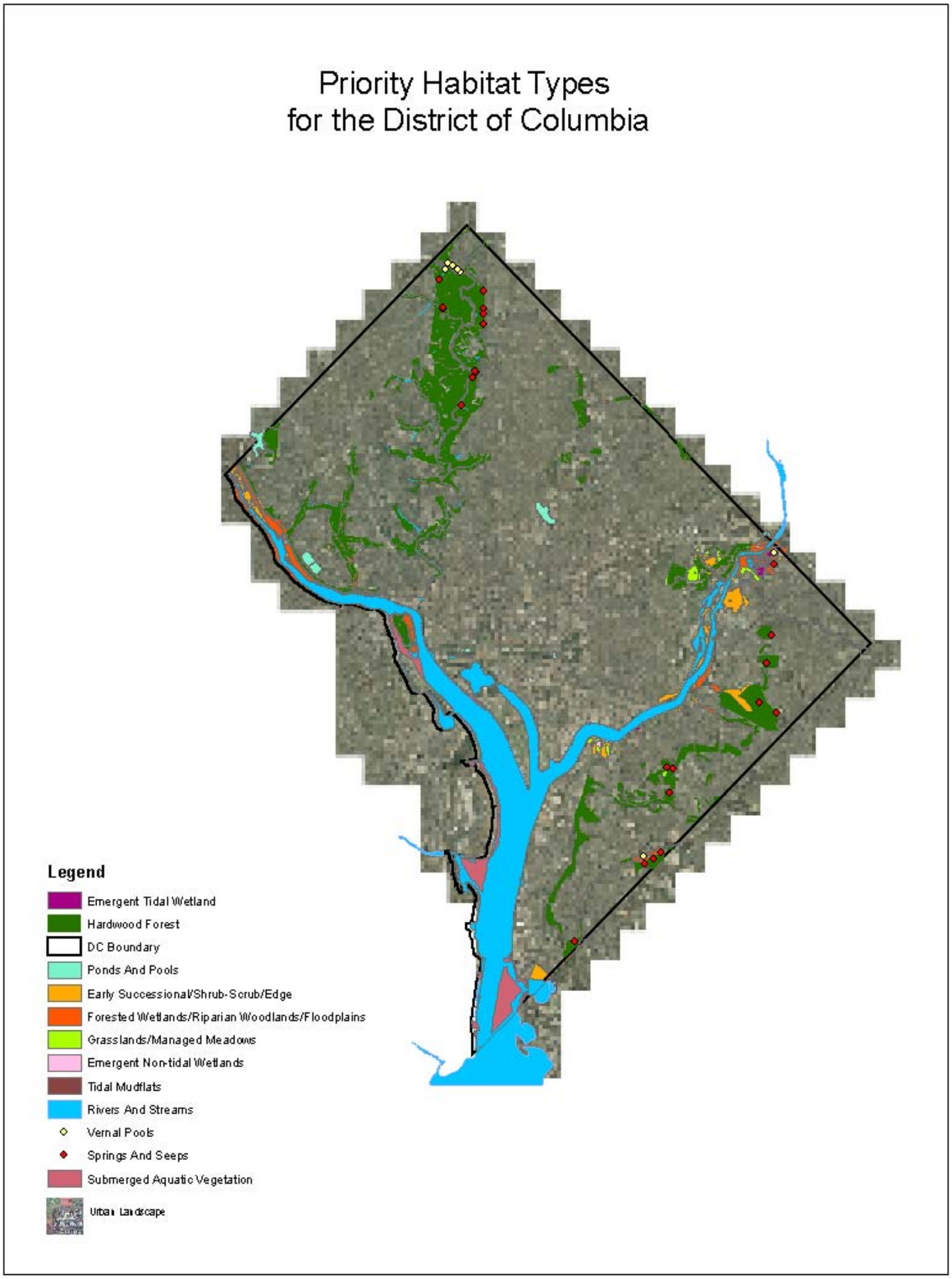
Table 7. Priority habitat types

Habitat Types	
Terrestrial	Hardwood forest
	Early successional/ Shrub-scrub/ Edge
	Grasslands/ Managed meadows
	Urban Landscapes
Aquatic	Rivers and streams
	Forested wetlands, Riparian woodlands, Floodplains
	Emergent tidal wetlands
	Emergent non-tidal wetlands
	Tidal mudflats
	Vernal pools
	Springs and seeps
	Submerged aquatic vegetation
	Ponds and pools

Habitat types are ordered based on the prioritization process, as described in Chapter 3. In sum, habitat types that house greater numbers of species in greatest conservation need, as well as a larger acreages of land are of greater conservation priority. The following Summary Chart lists the habitats in order of their priority:

Table 8. Habitat types prioritized

Rank	Habitat Type	# species	acreage
1	Rivers & streams	62	~4645
2	Hardwood forests	45	~6864
3	Emergent non-tidal wetlands	40	<500
4	Grasslands/ Managed meadows	23	<1000
5	Forested wetlands/ Riparian Woodlands/ Floodplains	22	<1000
6	Early successional/ Shrub-scrub/ Edge	19	<15000
7	Emergent tidal wetlands	12	<2000
8	Urban landscapes	10	~24,000
9	Tidal mudflats	10	<600
10	Springs and seeps	10	<100
11	Submerged aquatic vegetation	8	<1000
12	Vernal pools	7	<200
13	Ponds & pools	6	<500


Priority Habitat Types
for the District of Columbia
Legend
Emergent Tidal Wetland
Hardwood Forest
DC Boundary
Ponds And Pools
Early Successional/Shrub-Scrub/Edge
Forested Wetlands/Riparian Woodlands/Floodplains
Grasslands/Managed Meadows
Emergent Non-tidal Wetlands
Tidal Mudflats
Rivers And Streams
Vernal Pools
Springs And Seeps
Submerged Aquatic Vegetation
Urban Landscape

Terrestrial habitats

Hardwood Forest

Hardwood forests house 45 species of greatest conservation need, making hardwood forests the second highest priority habitat. Five major types of hardwood forest are found within the District, including chestnut oak forests, mixed oak—beech forests, tulip poplar forests, loblolly pine—mixed oak forests, and Virginia pine—oak forests.

1. Chestnut oak forests occur on ridgetops, convex upper slopes, and south-facing slopes, and are often associated with the mid-Atlantic Piedmont. Soils found in these forests are rocky, well-drained, acidic, sandy loams with a poorly developed organic layer and bedrock close to or at the surface. A conservation concern of these types of forests is that surface runoff and erosion is common.[33]

   Dominant vegetation includes:

   - Canopy— Chestnut oak, Black gum
   - Sub-canopy— Serviceberry, Sassafrass
   - Shrub layer— Blueberry, Black huckleberry
   - Herbaceous— sparse

2. Mixed oak—beech forests are mixed hardwood upland forests that occur on mesic to dry-mesic slopes or gentle gradients, primarily on or in close proximity to the mid-Atlantic Coastal Plain. Soils found in these forests are typically well-drained, acidic sandy loams, which may be derived from parent material of relatively greater fertility. This type of forest is of conservation concern because, for example, it has been mapped in Glover Archbold Park, which is a priority habitat location of this CWCS, and the characteristics of the soil may play a role in the proliferation of non-native species at this site.[34]

   Dominant vegetation includes:

   - Canopy— Beech, White oak, Tulip poplar
   - Sub-canopy— American holly, flowering dogwood
   - Shrub layer— Maple-leaved viburnum
   - Herbaceous— Bellwort, Virginia creeper, Solomon's seal, Christmas fern

3. Tulip poplar forests occur along streams and on mesic, mid-slope to low-slope sites that have been cleared and/or cultivated. They have been found on areas mapped as Manor loam soils that are deep, well-drained and underlain by acidic rock. These types of forests could be of conservation concern because they are successional

[33] USGS-NPS Vegetation Mapping Program. Vegetation Descriptions. http://biology.usgs.gov/npsveg/rocr/descript.pdf, p. 21-22.
[34] USGS-NPS Vegetation Mapping Program. Vegetation Descriptions. http://biology.usgs.gov/npsveg/rocr/descript.pdf, p. 12-13.

forests that follow cropping or clearcut logging or other sever disturbances, including fire.[35]

Dominant vegetation includes:

- Canopy— Tulip poplar
- Sub-canopy— Boxelder
- Shrub layer— Spicebush, Blackberry, Multiflora rose, Porcelain berry
- Herbaceous— Lesser celandine

4. Loblolly pine—mixed oak forests occur on mid to lower slopes on broad flats or in sheltered ravines, and are associated with the mid-Atlantic Coastal Plain. Soils within the District are well-drained to excessively drained gravelly sandy loams. This type of forest could be of conservation concern because it has a relatively high diversity of tree species.[36]

   Dominant vegetation includes:

   - Canopy— diverse; no dominate species; species include Black cherry, Sweet gum, Post oak, Turkey oak, Willow oak, Loblolly pine
   - Sub-canopy—
   - Shrub layer—
   - Herbaceous— sparse

5. Virginia pine—oak forests occur on middle to upper slope positions at elevations below 3,000 feet. Within the District, these forests usually occur on well-drained soils of hilltops. These types of forests could be of conservation concern because they were once common in 1977, but have now almost all succeeded to hardwood forests.

   Dominant vegetation includes:

   - Canopy— Virginia pine, Oaks, Tulip poplar
   - Sub-canopy— Oak
   - Shrub layer— Maple-leaved viburnum
   - Herbaceous— sparse

An overarching conservation concern of all hardwood forest habitats is changes to the composition and vegetation structure. Some species specialize in specific vertical vegetation structures so that changes to the structure creates habitat unfit for those species. For example, the Wood Thrush is a species of greatest conservation need that requires a well-developed subcanopy and midstory vegetation with a relatively open understory and decaying leaf litter.[37]

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[35] USGS-NPS Vegetation Mapping Program. Vegetation Descriptions. http://biology.usgs.gov/npsveg/rocr/descript.pdf, p. 18-19.
[36] USGS-NPS Vegetation Mapping Program. Vegetation Descriptions. http://biology.usgs.gov/npsveg/rocr/descript.pdf, p. 27-28.
[37] Partners in Flight. *Bird Conservation Plan for the Mid-Atlantic Coastal Plain*. Williamsburg: College of William and Mary, 1999, pg. 39.

One cause of a change in a forest's vertical structure is overbrowsing of the understory by deer. In fact, overbrowsing is a serious conservation threat within the District. Currently Rock Creek Park is assessing the damage to the understory by deer overbrowsing and has produced an Internal Scoping Report. Overbrowsing may be a serious threat to hardwood forest habitat and may require the production of a deer management plan. DC Fisheries and Wildlife Division staff plans to partner with the National Park Service to address the threat of overbrowsing across the District.

Currently, overbrowsing is not one of the top five threats to hardwood forest habitats and hopefully through the National Park Service's efforts and the conservation actions of this CWCS, deer overbrowsing will never become a higher-ranking threat. However, a high-ranking threat in emergent tidal wetland habitats is goose overbrowsing. The Anacostia Watershed Society is working with the Patuxent Wildlife Research Center, the DC Fisheries and Wildlife Division, the DC Watershed Protection Division, the National Park Service, MD Department of Natural Resources and other agencies and organizations to address this threat.

Grasslands/ Managed Meadows

Grasslands are home to 23 species of greatest conservation need and are a habitat that is at risk within the District and surrounding region. Grasslands are composed of vegetation that does not mature into successional growth or shrubland. They are primarily composed of grasses and can only sometimes support scattered shrubs and trees. Managed meadows are natural areas that are similar in ecological structure to grasslands but are managed by agencies and organizations by practices such as mowing.

While the availability of grasslands declines, it appears to be one of the last remaining strongholds for the Grasshopper Sparrow in the northeast. Furthermore, species that rely on open grasslands for breeding are among the species with the highest rates of population decline such as the Bobolink.[38] Therefore, grassland species as well as their habitat, especially large patches of grasslands, are in need of conservation.

Early Successional/ Shrub-scrub/ Edge

Early successional/ shrub-scrub/ edge habitats are home to 19 species of greatest conservation need. These habitats are habitats that have not matured into forest because of periodic natural or human disturbances. They are characterized by natural or semi-natural woody vegetation with aerial stems, generally less than six meters tall, with individuals or clumps not touching or interlocking. Both evergreen and deciduous species of true shrubs, young trees, and trees or shrubs are small or stunted because of environmental conditions. Shrubs dominate this habitat, with shrub canopy accounting for 25 to 100 percent of the cover. Shrub cover is generally greater than 25 percent when tree cover is less than 25 percent.[39]

[38] Partners in Flight. *Bird Conservation Plan for the Mid-Atlantic Coastal Plain*. Williamsburg: College of William and Mary, 1999, pg. 45-46.
[39] http://www.djcase.com

Some species depend on the type of vegetation that thrives in areas that have not matured into forest. For example, the American Woodcock is a species of greatest conservation need that prefers moist early successional habitat scattered with alder, dogwood, crab apple and hawthorn. It feeds at twilight or night by probing damp ground in fields or woods for earthworms, grubs, slugs and insects. Because of these specific habitat requirements, the American Woodcock serves as a good indicator species for early successional habitat suitable for many other species.[40]

Urban landscapes

Urban landscapes are home to at least 10 species of greatest conservation need. After further research, more species are expected to be found using this habitat. Urban landscapes include both built and natural areas that are managed for human use. Usually these areas are mowed, trimmed, experience a great deal of foot traffic, and are exposed to wind because they are cleared. These areas consist of the remaining land not identified under the other twelve habitats listed in this CWCS, including golf courses, school campuses, backyards, cemeteries, land surrounding memorials and monuments, and unvegetated areas such as roads, residential and commercial buildings, and parking lots. These areas are divided among the District's 8 wards, which would be equivalent to counties in a state.

While some urban landscapes are built space, they still provide habitat for wildlife and are important areas for conservation planning. Within the extremely urbanized setting, the natural areas could provide important wildlife habitat and migratory corridors. There are several options for transforming urban landscapes into habitat, including using native plants in landscaping, strategic mowing, limiting pesticides, turning off lights in buildings and educating the public as to keeping pets inside and as to the value of wildlife.[41]

Because the District has a large acreage of urban landscapes, it has a responsibility for conserving species that specialize in urban habitats. For example, the District has a high responsibility for ensuring that the Chimney Swift maintains stable populations since it is a species that specializes in urban habitats.

Currently, conservation agencies and organizations within the District lack information regarding the species of greatest conservation need that use these areas. However, urban landscapes represent a large portion of the District's land use and have a high potential for providing habitat and management opportunities. Thus, a strategy of this CWCS is to start the research and surveys that are necessary to develop the expertise on the wildlife component of these urban landscapes in order to identify impacted species of greatest conservation need and to determine the most effective conservation actions.

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[40] Partners in Flight. *Bird Conservation Plan for the Mid-Atlantic Piedmont*. College Park: University of Maryland, 2003, p. 25.

[41] Chicago Region Biodiversity Council. *Biodiversity Recovery Plan*. Chicago: Chicago Region Biodiversity Council, 1999, p. 63.

Aquatic habitats

Rivers and Streams

The District is home to two rivers—the Potomac and Anacostia—and several streams. They provide habitat for 62 species of greatest conservation need, making it the highest priority habitat. All wildlife taxa utilize the rivers and streams in some way, whether it is to drink, forage, breed, travel, or live. All life depends on water so the health of the District's rivers and streams affects all species of greatest conservation need. It is critical to have clean and healthy river and stream habitat.

They also perform many other ecological functions. They form natural corridors that connect otherwise isolated habitats. They connect the neighboring states to the District's habitats. They carry sediment and pollution downstream across borders. They are important for recreational activities such as fishing, swimming, wildlife observation and boating and are aesthetic amenities for residential development and public open space. Drainage conveys urban waste and runoff from the land, especially during floods.

However, the reliance on rivers and streams as conduits for stormwater and wastewater, as well as stream channelization and the alteration of the stream's watershed, has greatly diminished their ability to perform their functions. As a result, this habitat for wildlife faces erosion, degraded water quality and frequent flooding.[42] Erosion and pollution are two of their greatest threats.

Emergent Non-tidal Wetlands

Emergent non-tidal wetlands are home to 40 species of greatest conservation need and the third highest priority habitat type. Emergent non-tidal wetlands are newly-formed wetlands that are not subject to tides.[43] While this type of wetland does not support fish populations because it does not become inundated with water, it is habitat for invertebrate species that live in the substrate and the reptile, amphibian and the bird species that feed on those invertebrates.

[42] Chicago Region Biodiversity Council. *Biodiversity Recovery Plan*. Chicago: Chicago Region Biodiversity Council, 1999, p. 77.
[43] http://www.wetlands.com/pro/fr21jul99pte.htm

Forested wetlands, Riparian woodlands, Floodplains
Together, forested wetlands, riparian woodlands and floodplains are home to 22 species in greatest conservation need.

Forested wetlands are wetlands that support vegetation with roots that are adapted to saturation during the growing season. Nationwide, forested wetlands account for the greatest amount of wetland loss and are experiencing changes in plant composition. The mid-Atlantic Coastal Plain accounts for nearly 7.4% of these wetlands. Between the 1950s and 1970s, nearly 2.5 million hectares of forested wetlands were lost. Much of this loss was due to the harvest of wetland forests or to filling or draining of forested wetlands for conversion to agriculture or urban development.[44]

The Prothonotary Warbler is a breeding bird of greatest conservation need that inhabits mature forested wetlands of the Coastal Plain. They require a relatively low, open canopy, a high density of small stems, cavities, and prefer the flooded rather than drier areas. Because of these highly specific habitat requirements, they are a good indicator species for permanently forested wetlands. Therefore, conserving enough habitat to support their populations would also provide enough habitat for other species of greatest conservation need such as the Yellow-throated Vireo.[45]

Riparian woodlands are woodlands on either side of rivers and streams. They create recreational activities such as fishing and camping. These areas help purify the water by:

- removing sediments,
- reducing the risk of flooding,
- reducing bank erosion, and
- providing water, food and habitat for a diversity of plant and wildlife species[46]

Floodplains are low plains adjacent to stream banks, rivers, lakes or oceans and are subject to temporary or irregular flooding.[47] Floodplains are shaped by the frequency and duration of flooding, by nutrient and sediment deposition, and by the permeability of the soil. Flooding usually occurs during early spring when the snow is melting or during times of unusually heavy rainfall. The flooding of the area is important for the plant and wildlife species that inhabit or utilize the floodplain. These areas are of conservation concern because when they are developed or disturbed, overflowing and flooding can occur on the banks.[48]

Within the District, floodplains are associated with the mid-Atlantic Piedmont and the soils tend to be strongly acidic and moderately well-drained to somewhat poorly-drained Codorus silt loam with smaller deposits of sand and gravel. Woody debris typically

[44] Partners in Flight. *Bird Conservation Plan for the Mid-Atlantic Coastal Plain*. Williamsburg: College of William and Mary, 1999, p. 33.
[45] Partners in Flight. *Bird Conservation Plan for the Mid-Atlantic Coastal Plain*. Williamsburg: College of William and Mary, 1999, p. 36.
[46] http://www.blm.gov/education/riparian/define.html
[47] http://www.floodplain.org/flood_basics.htm
[48] http://www.twingroves.district96.k12.il.us/Wetlands/Floodplain/Floodplain.html

covers 15% of the ground surface, whereas a leaf litter layer may be thin to absent. Floodplains within the District tend to be small with an average of about 30-40 acres.[49] The canopy cover is 50-90%, but the understory is more open than hardwood forests due to the frequent flooding.[50]

Dominant vegetation includes:

- Canopy— Sycamore
- Sub-canopy— Box elder
- Shrub layer— Spicebush
- Herbaceous— Garlic mustard, Jewelweed[51]

Emergent Tidal Wetlands

Emergent tidal wetlands are home to 12 species of greatest conservation need. They are newly-formed wetlands that are inundated by tidal waters. They can be seasonally, temporarily, and semi-permanently flooded. Emergent vegetation is important for water quality because it acts as a filter for sediment and other substances. Common plant species include wild rice, duck potato, American lotus, polyganum spp, soft rush, pickerelweed, sedges, bulrush, nuphar, common boneset, spikerush, wool-grass, spatterdock, swamp milkweed, and stiff march bedstraw.[52]

More than 90% of the Anacostia River's wetlands have been destroyed or altered, mostly due to land conversion, urban development and dredging and filling.[53] The Wetlands Act of 1972 has been able to slow the trend wetland conversion across the country.[54] Locally, one of the top five threats to emergent tidal wetlands is overbrowsing by resident Canada Goose populations. The geese eat the wild rice and other native vegetation, which diminishes the habitat for other animal species and increases opportunities for non-native invasive plant species.

The Anacostia Watershed Society is working with the Patuxent Wildlife Research Center, the DC Fisheries and Wildlife Division, the DC Watershed Protection Division, the National Park Service, MD Department of Natural Resources and other agencies and organizations to address this threat. The National Park Service will be producing a goose management plan. However, management options in the District are limited because all wildlife is protected under the Water Pollution Control Act of 1984[55].

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[49] USGS-NPS Vegetation Mapping Program. Vegetation Descriptions. http://biology.usgs.gov/npsveg/rocr/descript.pdf, p. 23-24.
[50] Chicago Region Biodiversity Council. *Biodiversity Recovery Plan*. Chicago: Chicago Region Biodiversity Council, 1999, p. 44.
[51] Chicago Region Biodiversity Council. *Biodiversity Recovery Plan*. Chicago: Chicago Region Biodiversity Council, 1999.
[52] http://www.apg.army.mil/apghome/sites/directorates/restor/wetlands.html
[53] http://www.anacostia.net/report/goal_4.htm
[54] Partners in Flight. *Bird Conservation Plan for the Mid-Atlantic Coastal Plain*. Williamsburg: College of William and Mary, 1999, p. 29.
[55] Water Pollution Control Act of 1984, p. 2032-3.

Tidal mudflats

Tidal mudflats are home to 10 species of greatest conservation need. They are wetlands that occur between vegetated marsh and the water's edge and are alternately exposed and submerged by the tide. Tidal mudflats occur where wave energy is low and herbaceous vegetation covers less than 10% of the mud.[56] They are important for wildlife because they provide habitat and at the same time improve habitat quality by purifying the water. Many invertebrates live in the mud and provide food for birds and mammals when the tides are out.[57]

Springs and seeps

Springs and seeps of the District are a very important habitat because they are home to two endemic and one federally endangered species of greatest conservation need. The Hay's Spring amphipod is both endangered and endemic and Kenk's amphipod is endemic to Rock Creek. Springs and seeps within the District are required by several other of the District's species of greatest conservation need, particularly rare subterranean amphipods and copepods. A comprehensive inventory of groundwater invertebrate species within the District is needed to identify all of the species, threats, and conservation needs of this habitat, but resident expert opinion of the CWCS Working Group expects such an inventory to reveal springs and seeps to remain a priority habitat.

Springs and seeps occur where groundwater flows to the surface. A spring has a concentrated flow, whereas a seep has a diffuse flow.[58] Springs occur when the water table is higher than the ground surface and pressure forces the water out of the land.[59] They serve as a water source for almost every kind of wildlife species.[60] The District's springs were once the best source of drinking water in the 1700s and 1800s. Today, those springs have disappeared due to the diversion of rainwater, direct piping into the sewers, filling or contamination.[61]

Seeps are areas where groundwater continuously surfaces and flows down a slope. They support habitats made up of tiny mosses, lichens, ferns and flowering plants that cling to the surface of the slope.[62]

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[56] Florida draft CWCS

[57] http://www.petalumawetlandspark.org/HTML/Station7.html

[58] Chicago Region Biodiversity Council. *Biodiversity Recovery Plan*. Chicago: Chicago Region Biodiversity Council, 1999, p. 56.

[59] http://pasture.ecn.purdue.edu/~agenhtml/agen521/epadir/grndwtr/spring.html

[60] http://www.nps.gov/dewa/pphtml/subnaturalfeatures21.html

[61] Pavek, Diane. *Endemic Amphipods in our Nation's Capital*. Endanged Species Bulletin, Jan/Feb 2002. Vol. xxvii, no. 1, p.8.

[62] http://www.nps.gov/dewa/pphtml/subnaturalfeatures21.html

Submerged Aquatic Vegetation

Submerged aquatic vegetation (SAV) in the District is a very important habitat type for both resident and catradromous fish. It is utilized by both aquatic and terrestrial species, of which eight are on our list of species of greatest conservation need. SAV provides food and habitat for many aquatic species, as well as helps to prevent erosion and sedimentation. Many species depend upon SAV for foraging or spending their juvenile life stages. SAV is decreasing throughout the District's waterways which has a negative impact on both aquatic habitats and species of greatest conservation need.[63]

This habitat is made up of permanently submerged vegetation and can be a mix of from one or two species in small patches, to seven to ten species in larger patches; the large mat had seven species in 2003. The largest patch of SAV in the District is located just upstream of the Woodrow Wilson Bridge. Species commonly found in the SAV beds in the District include *Hydrilla* v*erticillata, Ceratophyllum demersum, Myriophyllum spicatum, Vallisneria americana, Heteranthera dubia,* and *Najas minor, Najas guadalupensis, and Myriophyllum spicatum.*

The SAV beds in the District are constantly changing, both in size and location, in response to several environmental variables all related to water quality. This prime aquatic habitat is constantly threatened by poor water quality related to high suspended solid loads because these solids block light from penetrating to the plants. During dry years, or during years when solids loading is high before or after the active growing season, the SAV can become established. During years when the loadings are high during the growing season however the plants either do not develop to the stage where seeds or shoots are not produced, or can die off entirely. Once the SAV density declines more river, stream and pond bottom is exposed to further erosion and resuspension of sediment. Depending on the amount of precipitation in any one year then, our SAV beds can either flourish or decline. In 2002 there were 699 acres of SAV and after a record wet year in 2003 the acreage was down to 24 acres.

Presently the District is actively monitoring its SAV beds and plans are being developed to try test plantings. Potential partners include the Earth Conservation Corp, National Park Service, and the Anacostia Watershed Society in planting efforts. Enhanced SAV populations could not only help stabilize river, stream and pond bottom, but also enhance essential habitat for our aquatic and terrestrial species with the greatest conservation need.

[63] http://www.chesapeakebay.net/info/baygras.cfm

Vernal pools

Vernal pools are seasonal bodies of water that flood each year for a few months during the spring and dry up by the end of summer. Because they are not permanently flooded, they do not support fish populations. Instead, they provide important breeding habitat for many species of amphibians. Some species, such as the spotted salamander and wood frog, are obligate vernal pool species, meaning that they require vernal pools to breed.[64]

Vernal pool habitat in the District is by definition a transitory habitat, but even while transitory it provides habitat for seven of the District's species of greatest conservation need. The habitat is most often found in woodland areas but some are also found in the rocky floodplain area of the Potomac River.

Threats encountered by local vernal pool habitats can be as varied as surface runoff contamination caused by nearby development, or poaching of species which inhabit these habitats. Threats also include changes in nearby land use, or climatological changes, which can alter the hydrology of the surrounding area. Since vernal pool habitat is so reliant on an area's hydrology, if the hydrology changes the habitat can either be disrupted where it will no longer support its previous species diversity, or it may totally disappear. In an urban area like the District, developmental pressures are constantly threatening the continuation of these marginalized habitats.

Vernal pool management is new to the DC Fisheries and Wildlife Division. Therefore, partnerships will be critical for guidance in the inventory and management of priority habitats, with an eye on restoration and even the creation of new habitats. Potential partners include the National Park Service and the US Fish and Wildlife Service. Over the next five years, the DC Fisheries and Wildlife Division hopes to develop a permanent system for tracking these habitats in the District. Currently, Rock Creek Park conducts monitoring surveys of vernal pools and amphibian egg masses occurring within the park.

[64] http://www.nhaudubon.org/conservation/vernal.htm

Ponds and pools

Pond and pool habitat in the District, while a relatively minor habitat type, supports six species of greatest conservation need. These habitats consist of small impoundments which are not presently actively surveyed or managed by the DC Fisheries and Wildlife Division. They often contain some submerged aquatic vegetation, another priority habitat, and can potentially support bird, fish, invertebrate, amphibian, reptilian, and mammalian species.

The pond and pool habitats are endangered mainly from threats which are directly, or indirectly related to development. Nearby development can directly effect surface runoff contamination into the systems, and if runoff is extreme there can also be erosion and erosional deposition of sediments into the habitats. As with any system supporting SAV, erosional deposition generally leads to increased suspended solids in the water column and thus decreased light penetration. With a decrease in light penetration there is a decreased chance for SAV to become established or be maintained.

Because the District is highly urbanized, ponds and pools have a high potential for providing habitat to many aquatic species of greatest conservation need within urbanized areas. However, pond and pool habitat, like that of vernal pools, is not currently surveyed or managed by the DC Fisheries and Wildlife Division. Therefore, partnerships, especially the National Park Service and the US Fish and Wildlife Service, are essential for guidance in inventory and management of pond and pool habitats, with an eye on restoration and even creation of new pond and pool habitats.

Priority Habitat Locations

Below is a list of all priority habitats locations divided into the habitat types listed above. The selection process of priority habitat locations was explained in Chapter 3.

Terrestrial

Hardwood Forests

- Glover Archbold Park
- National Arboretum
- Kenilworth Park (River Trail)
- Shepherd Parkway
- St. Elizabeth hospital
- Catholic University
- Oxon Cove Park
- Rock Creek Park
- Fort Circle Parks
- Oxon Run Parkway
- Suitland Parkway
- Veteran's Hospital
- National Zoo
- Lincoln Wetland Complex (between Nat. Arboretum & Anacostia Park)

Grasslands / Managed Meadows

- Oxon Cove
- Poplar Point
- Anacostia Park
- National Arboretum
- Kenilworth Park
- Rock Creek Park
- Fort Circle Parks
- Oxon Run Parkway
- Veteran's Hospital area

Early Successional / Shrub-Scrub/ Edge

- Kingman Island
- Poplar Point
- Fort Dupont (along Old Golf Course Fairways
- Anacostia Park (bet RR track & Benning Rd.)
- National Arboretum
- Kenilworth Aquatic Gardens
- Fort Lincoln
- Right of Ways

Urban Landscapes

- The National Mall
- Anacostia Park
- National Arboretum
- Hains Point Golf Course
- Cemeteries
- School campuses
- Langston Golf Course
- Wards 1-8

Aquatic

Rivers & Streams

- Potomac River
- Anacostia River
- Rock Creek and tributaries
- Oxon Run
- Hickey Run
- Fort Dupont
- Pope's Branch
- Watts Branch

Emergent Non-tidal Wetlands

- Poplar Point
- Lincoln Wetland Complex
- National Arboretum
- Kenilworth Aquatic Gardens
- Oxon Run Parkway
- Fort Dupont
- C&O Canal

Forested Wetlands/ Floodplains / Riparian Forests

- Watt's Branch
- Oxon Run Parkway
- Oxon Cove
- Kenilworth Aquatic Gardens
- Rock Creek Park
- Lincoln Wetland Complex (near NY Ave.)
- Kingman Island
- National Arboretum
- Anacostia Park
- C&O Canal
- Theodore Roosevelt Island

Emergent Tidal Wetlands

- Anacostia River
- Kenilworth Aquatic Gardens
- Kingman Island
- Theodore Roosevelt Island

Tidal Mudflats

- Anacostia Park
- Kenilworth Aquatic Gardens
- Kingman Island
- Oxon Cove
- Theodore Roosevelt Island

Springs & Seeps

- Rock Creek Park
- Oxon Run Parkway
- Fort Circle sites
- National Arboretum

Submerged Aquatic Vegetation

- Potomac River
- Anacostia River

Vernal Pools

- Kenilworth Aquatic Gardens
- Fort Dupont
- National Arboretum
- Rock Creek National Park
- Oxon Run Parkway
- Heritage Island
- C&O Canal

Ponds & Pools

- McMillan Reservoir
- Kenilworth Aquatic Gardens
- National Arboretum
- Soldier's/ Veteran's home
- Constitution Gardens
- Lincoln Wetland Complex
- Rock Creek Cemetery
- Del Carlia Reservoir
- Langston Golf Course